

WHAT IS CLAIMED IS:

1. A magnetic recording medium comprising a non-magnetic substrate and at least one magnetic recording layer formed on the substrate via at least one soft magnetic layer, wherein the surface roughness ( $R_a$ ) of the magnetic recording medium is at most  $50\text{\AA}$ , and the product ( $\mu_{\text{max}} \times t$ ) of the maximum permeability ( $\mu_{\text{max}}$ ) and the thickness ( $t$ ) of the soft magnetic layer is at least  $1,000,000 \text{ (H}\cdot\text{\AA/m)}$ .
2. The magnetic recording medium according to Claim 1, wherein a plurality of soft magnetic layers are present, and a separate layer is provided between the adjacent soft magnetic layers.
3. The magnetic recording medium according to Claim 1, which has from 2 to 20 soft magnetic layers, and a separate layer is provided between the adjacent soft magnetic layers.
4. The magnetic recording medium according to Claim 2, wherein the total thickness of the plurality of soft magnetic layers and separate layers is from 500 to  $10,000 \text{\AA}$ .
5. The magnetic recording medium according to Claim 2, wherein the ratio of the total thickness of the plurality of soft magnetic layers and separate layers to the thickness of the separate layers, is from 1:0.05 to 1:0.5.
6. The magnetic recording medium according to Claim 2, wherein the ratio of the total thickness of the plurality

of soft magnetic layers and separate layers to the thickness of the separate layers, is from 1:0.07 to 1:0.2.

7. The magnetic recording medium according to Claim 2, wherein the separate layers are non-magnetic layers.

5 8. The magnetic recording medium according to Claim 2, wherein the separate layers are Cr or an alloy containing Cr as the main component.

9. The magnetic recording medium according to Claim 2, wherein the thickness of separate layers is from 50 to  
10 300Å.

10. The magnetic recording medium according to Claim 1, wherein the maximum permeability of the soft magnetic layer is from 10 to 1,000,000 H/m.

11. The magnetic recording medium according to Claim 1,  
15 wherein the coercive force of the soft magnetic layer is at most 100 Oersted.

12. The magnetic recording medium according to Claim 1, wherein the soft magnetic layer is made of a NiFe alloy or a NiFeMo alloy.

20 13. The magnetic recording medium according to Claim 1, which is a perpendicular magnetic recording medium.

14. A magnetic recording apparatus comprising a magnetic recording medium, a driving means to drive the magnetic recording medium in a recording direction, a magnetic  
25 head provided with a recording section and a reproducing section, a means to relatively move the magnetic head against the magnetic recording medium, and a

recording/reproducing signal treating means to input  
recording signals to the magnetic head and to output  
reproducing signals from the magnetic head, wherein the  
magnetic recording medium is a magnetic recording medium  
5 as defined in Claim 1.